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Radiocarbon age of Pre-bomb Surface Waters in North Pacific Coastal Regions

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Pre-bomb reservoir ages for northern Pacific coastal waters have been determined by AMS 14C measurements on mollusk shells of known age from museum collectioins. Since organisms such as mollusks have been shown to record the carbon isotopic composition of the water in which they are growing, biogenic carbonates of known calendar age can be used to determine the reservoir age for a particular site. Well characterized reservoir ages are necessary for calibration of radicoarbon dates from marine sediment cores and coastal archaeological sites and for constraining models of ocean circulation.

Mollusk shells have been 14C dated from coastal sites in China, Korea, Japan, Russia and North America. Reservoir ages measured vary from about 450 years in the Sea of Japan to 1100 years off the Kamchatka Peninsula. We explain the large reservoir ages found in high latitude coastal regions by the supply of "old" North Pacific deep waters into the mixed layer by upwelling and deep mixing processes.

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